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Remarks

Claims 17, 19, 20 and 22 remain in this application. Claims 18 and 21 have been canceled. Claims 17, 19, 20 and 22 have been amended herein.

In Applicant's amendment that was filed in July, 2001, both legal assertions and factual statements were made with regard to a rejection of the pending claims under 35 U.S.C. 103(a). In the most recent Office action of October 2, 2001, there was a response to the legal considerations, but unfortunately the Office action did not directly respond to the factual remarks. Applicant respectfully submits that the features of claims 18 and 21 have been mischaracterized. In order to ensure that these features are properly considered on appeal, independent claim 17 has been amended to incorporate the features of claim 18, while independent claim 20 has been amended to incorporate the features of dependent claim 21.

The amendments to the claims place the pending claims in a better condition for consideration on appeal. Since the features that were added by amendment to claims 17 and 20 were previously contained in dependent claims, the amendments do not add new subject matter for con-sideration and do not require additional searching. The only difference between the amended claims and the combination of claims prior to amend-ment is that all references to "radii" have been deleted. The references to "radii" have been removed both because the remaining claim description is believed to be clearer and because the remaining claim description more accurately claims the embodiment that was argued in the prior amendment and that is supported by the specification (e.g., the text regarding Fig. 10). While a Section 112 rejection was not raised, Applicant regrets the inaccuracy caused by the use of the term "radii." However, the inaccuracy has no effect on the Section 103(a) determination, since Applicant respectfully points out that the cited prior art reference teaches <u>straight</u> boundaries. Applicant requests that the amendments to the claims be entered.

Amended claims 17 and 20 describe an array of photosensors disposed in columns and rows. The photosensors combine to define an optical axis for the array. Adjacent columns in the array are spaced apart by an arcuate boundary, <u>with curvature of the arcuate boundaries increasing with departure from the optical axis of the array</u>. Attached hereto as Exhibit A is a sheet of drawings that includes Fig. 9 and Fig. 10 of the pending application as originally filed. The amended claims do not "read on" Fig. 9,

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since none of the boundaries are arcuate. On the other hand, the array of photosensors shown in Fig. 10 are within the description of the amended claims. In the embodiment of Fig. 10, the optical axis is at the center of the array and vertical boundaries that space apart adjacent columns at or near the optical axis are relatively straight, as compared to the vertical boundaries between columns that are at or near the left and right edges of the array. That is, the curvatures of the arcuate boundaries between columns in Fig. 10 increase with departure from the optical axis. The embodiment of Fig. 10 also fits within the description of dependent claims 19 and 20, since adjacent rows of photosensors in the array are spaced apart by arcuate horizontal boundaries, <u>with curvature of these horizontal vertical boundaries increasing with departure from the optical axis of the array</u>.

With regard to the claimed feature of arcuate boundaries between photosensor columns and with regard to the feature of having the curvature of the arcuate boundaries increase with departure from the optical axis of the array, the Office action cited Fig. 1 of Durbin et al., stating that "having the columns spaced apart by an arcuate boundary with radii increasing with departure of curvature is also an inherent feature." The Durbin et al. teachings with regard to the cited Fig. 1 are consistent with the array shown in Fig. 9 of the attached Exhibit A. Fig. 1 of Durbin et al. is illustrated and described as being comprised of an array of pixels in which the resolution per individual pixel is 0.004 inch by 0.005 inch (column 9, lines 22–25). There are 492 pixels in the vertical direction and 512 pixels in the horizontal direction. Thus, the combined resolution in the horizontal direction is 2.560 inches (0.005×512) and the combined resolution in the vertical direction is 1.968 inches (0.004×492). This is very close to the dimensions taught in Fig. 1, which are 2.580 inches by 1.940 inches. Clearly, the rectangular pixels are in a side-by-side arrangement. That is, the arrangement is the same as the one labeled Fig. 9 in Exhibit A.

The Office action refers to the inherency of increasing radii "<u>with departure of curvature</u>." Applicant agrees that an arcuate boundary that <u>is departing from curvature</u> inherently will have an increasing radius of curvature. That is, a line that is becoming increasingly straighter will be characterized by an increasing radius of curvature. <u>However, Applicant respectfully points out that this is completely immaterial to the determination of the pending claims, since the feature does not exist in the pending claims and the pending claims cannot be reasonably reinterpreted to include this inherent feature regarding an increasingly straight line.</u> The limitation set

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forth in the pending claims regards curvature of arcuate boundaries (rather than an arcuate boundary) and regards increasing curvature with departure from the optical axis of the array (rather than with departure of curvature).

In Fig. 1 of Durbin et al. and in Fig. 9 of Exhibit A, each set of adjacent columns in the array is spaced apart by a straight boundary. Therefore, Applicant asserts that it is inaccurate to describe the columns of Durbin et al. as inherently being spaced apart by an arcuate boundary. While Applicant recognizes that it is permissible to broadly interpret claim language in a determination under Section 103(a), the broad interpretation must be reasonable and must be consistent with the understanding of persons skilled in the art. An arcuate boundary includes an arc. That is, the arcuate boundary must have a bend. The boundaries between adjacent columns of Durbin et al. do not include an arc. Even if one were to modify the photo-sensor array of Durbin et al. to have a shape other than a rectangle, it would not be an inherent feature to have arcuate boundaries between adjacent columns. It is conventional to form straight lines during integrated circuit fabrication, since adding curvature significantly increases the complexity and the cost of the process. Modifying the rectangular array of Durbin et al. could be carried out simply and economically by forming the array as taught by Fig. 1 of Durbin et al. and as shown in Fig. 9 of Exhibit A, and then removing portions of the array to provide the desired non-rectangular shape. Arcuate boundaries between adjacent columns of photosensors are not inherent.

Moreover, even if one were to impermissibly describe the boundaries between adjacent columns of Durbin et al. (or Fig. 9 of Exhibit A) as "arcuate boundaries," the curvatures of the arcuate boundaries do not increase with departure from the optical axis. As previously noted, In Fig. 10 of Exhibit A, the optical axis of the array is at the center of the array. The further that a column-to-column boundary Is from the optical axis, the greater the curvature of the boundary. In Fig. 1 of Durbin et al. and Fig. 9 of Exhibit A, each boundary has the same curvature. Thus, regardless of the distance from the optical axis of the array, the curvature of a boundary will be the same. The column-to-column boundaries of Durbin et al. are parallel lines. Durbin et al. does not inherently include the increasing curvature with departure from the optical axis. Nor does Durbin et al. teach or suggest increasing curvature of boundaries with departure of the boundaries from the optical axis of the array.

Dependent claims 19 and 22 also refer to a feature regarding arcuate boundaries with increasing curvature with departure from the optical

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axis of the array. However, the feature of claims 19 and 22 relates to the boundaries between adjacent rows of the array. The remarks made above regarding the curvature of the column-to-column boundaries apply equally to the description of the row-to-row boundaries.

Conclusion

Applicant has attempted to consider every reasonable interpretation of the claim language regarding arcuate boundaries and regarding the increasing curvature of the arcuate boundaries with departure from the optical axis of the photosensor array. Applicant is unable to determine how the claim language regarding this feature can be interpreted as being an inherent feature of Fig. 1 in Durbin et al. Applicant has also attempted to consider possible interpretations of the inherency rejection set forth in the Office action with regard to claims 18, 19, 21 and 22, since the features of claims 18 and 21 were incorporated into independent claims 17 and 20. The inherent feature referred to in the Office action is not a feature that is contained in any of the pending claims. The arcuate boundaries of Applicant's pending claims are not described as having radii which increase with departure of curvature. Rather, the various arcuate boundaries are described in the pending claims as increasing in curvature with departure from the optical axis of the photosensor array.

Applicant requests assistance in interpreting the rationale of the Office action, if the inherency reference is to stand. Such assistance will aid Applicant in determining the next step in the prosecution of the application. If the inherency reference does not stand, Applicant respectfully asserts that the rejection of the claims does not present a *prima facie* case of obviousness, so that the amendments to the independent claims place all of the pending claims in a condition for allowance.

Attached hereto is a marked-up version of the changes made to the claims by the current amendment. The attached pages are captioned "Version with Markings to Show Changes Made."

Applicant respectfully requests reconsideration of the claims in view of the amendments and remarks made herein. A notice of allowance is earnestly solicited. In the case that any issues regarding this application can

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      be resolved expeditiously via a telephone conversation, Applicant invites the Examiner to call Terry McHugh at (650) 969-8458.

                    Respectfully submitted,
                    Gary B. Gordon

By
                    Terry McHugh
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                    Reg. No. 33,261

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Claims:

Claims 17, 19, 20 and 22 have been amended as follows:

1 17. (amended) An arrangement of a sensor and optics comprising:
2   an array of photosensors; and
3   a lens system for providing a focus for imaging by said array,
4 said lens system having a characteristic of introducing curvilinear distortion of
5 an image to said array;
6   said array having a shape to achieve compensation of said
7 curvilinear distortion, including having arcuate edges to establish said
8 compensation[.] ;
9   wherein said photosensors are disposed in a plurality of
10 columns and a plurality of rows and wherein said photosensors combine to
11 define an optical axis for said array, adjacent columns being spaced apart by
12 an arcuate boundary, with curvatures of said arcuate boundaries increasing
13 with departure from said optical axis.

1 19. (amended) The arrangement of claim 17 [18] wherein adjacent rows are
2 spaced apart by second arcuate boundaries, with [radii of] curvature of said
3 second arcuate boundaries increasing with departure from said optical axis.

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1   20. (amended) An arrangement of a sensor and optics comprising:
2   a two-dimensional array of photosensors; and
3   a lens system for providing a focus for imaging by said array,
4   said lens system having a characteristic of optically introducing curvilinear
5   distortion of an image to said array;
6   said array having a curvilinear shape to achieve compensation
7   of said curvilinear distortion, including having a plurality of arcuate outer
8   edges to establish said compensation, said photosensors being varied
9   dimensionally to define said curvilinear shape, said curvilinear shape being
10   aligned relative to said curvilinear distortion to introduce a physical distortion
11   that offsets said optically introduced curvilinear distortion[.] :
12   wherein said photosensors are disposed in a plurality of
13   columns and a plurality of rows and wherein said photosensors combine to
14   define an optical axis for said array, adjacent columns being spaced apart by
15   an arcuate boundary, with curvatures of said arcuate boundaries increasing
16   with departure from said optical axis.

1   22. (amended) The arrangement of claim 20 [21] wherein adjacent rows are
2   spaced apart by second arcuate boundaries, with [radii of] curvature of said
3   second arcuate boundaries increasing with departure from said optical axis.

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